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TECHNOLOGY DEPARTME JULY 9, 1949

SCIENCE NEWS LETTER

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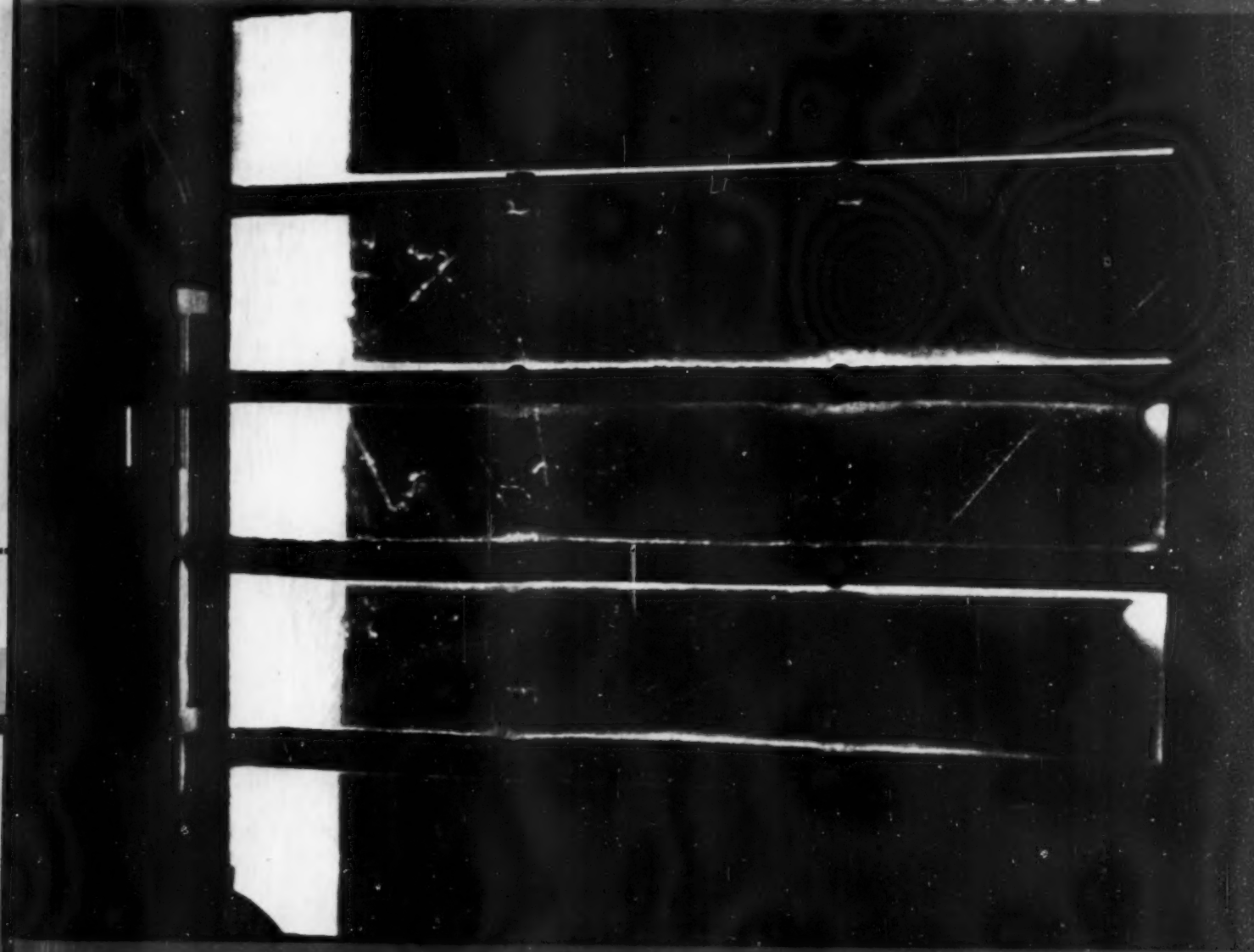
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Cosmic Heavy-Weight

See Page 31

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VOL. 56 PAGES 17-32

YOUR telephone receiver should treat each tone in the voice alike; that is important to you, because proper balance makes pleasant listening and easy understanding. Naturalness in receiver performance is pictured in a matter of seconds by the apparatus shown at left.

The receiver is clamped in place and an oscillator feeds into it frequencies representing all talking tones. Then a bright spot darts across an oscilloscope screen leaving behind it a luminous line which shows instantly

It listens so YOU can hear better

the receiver's response at each frequency. It is precise; and it is many times faster than the old method of measuring receiver performance point-by-point and then plotting a curve.

At Bell Laboratories, development of techniques to save *time* parallels the search for better *methods*. For each time an operation is made faster, men are freed to turn to other phases of the Laboratories' continuing job — making your telephone system better and easier for you to use each year.

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NUCLEAR PHYSICS

Source of Cosmic Rays

The sun, magnetic dust between stars, or the explosions of stars called supernovae, are some of the proposed energy-sources for cosmic radiation.

➤ WHAT big guns of the universe bombard the earth with the powerful but invisible cosmic particles? The sun, the dust between the stars or even far away in cosmic space, are possible origins of cosmic rays described to the University of Denver International Cosmic Ray Symposium in Idaho Springs, Colo.

A few years ago there was no satisfactory explanation of the birth of these radiations. Now, scientists have the choice of two or more ways the rays can get started and pick up the immense energies they carry to earth.

Picture great clouds of dust in motion in the vast spaces between the stars, clouds so diffuse that they could never be seen if man were there to view them. These clouds set up magnetic fields that travel along with the dust particles. When a bit of dust collides with a cosmic ray particle the particle may disappear. But if a particle gets around in this region safely, it picks up energy as it leaves and in many collisions gets energy as great as the cosmic rays need to plunge, as they do, into the earth's atmosphere. This birth process may go on for millions of years.

Dr. John A. Wheeler of Princeton discussed at the Symposium this theory for which Dr. Enrico Fermi of the University of Chicago is largely responsible. New ideas that the Swedish astronomer, Dr. Hannes Alfven, has put forth on energy in magnetic dust clouds have helped to produce this picture.

The sun, from which almost all other earth-received radiation comes, is the birthplace of most cosmic radiation as well, Dr. Edward Teller of the University of Chicago urged at the meeting. This allows the projectiles to get their energies closer to the earth. The radiation seems to come into the earth as it does because of the magnetic field of the earth.

To make the Teller theory work, it is necessary to have a sort of squashed-down magnetic field of the sun strongest in the plane of the revolving planets.

Still another theory is that the energy comes from tremendous explosions of stars called supernovae. Dr. Lyman Spitzer, Princeton astronomer, visualizes these explosions as shooting out immense amounts of radiation which strike the cosmic particles in such fashion as to give them the billion electron volts they need per unit particle in heavy atoms.

If the Fermi and Spitzer theories were both operated, they might explain everything, as the cosmic magnetic dust birthplace is reasonable for the protons (hearts of hydrogen atoms) that arrive from outer space, and the Spitzer theory makes possible the hearts of heavy elements that have recently been found.

These cosmic rays can be thought of as messages from the parts of the universe that human beings can never hope to visit. They are another way of looking into the depths of the universe, supplementing the giant telescopes which receive a different sort of radiation for astronomers to study.

It is a toss-up as to what is more important, discovery of what the cosmic rays are and do, or discovery from the radiation of how the universe and matter are put together.

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NUCLEAR PHYSICS

Find Big Atomic Showers

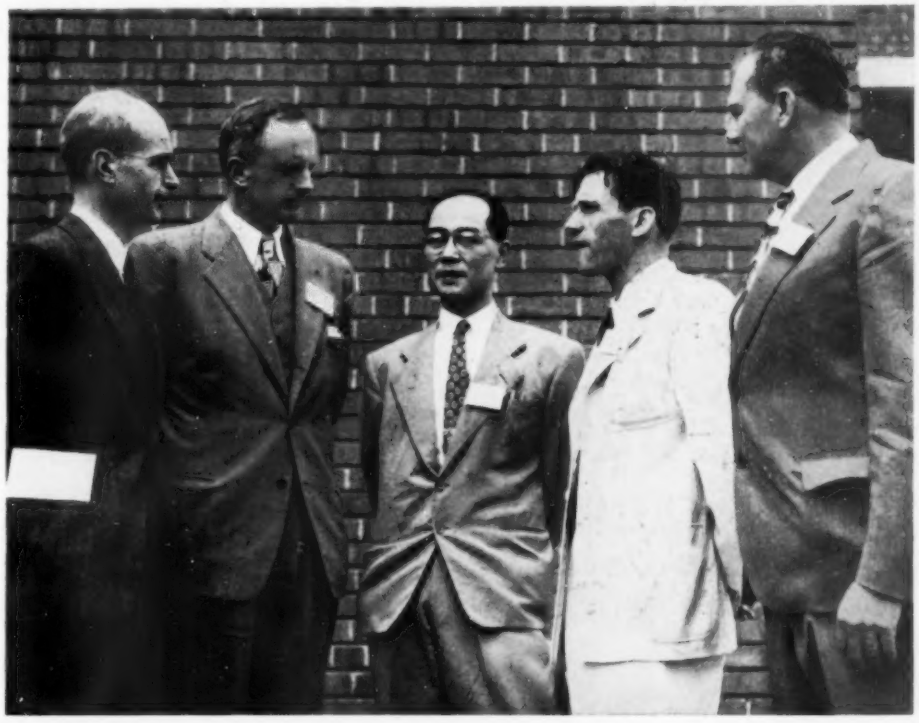
➤ IMMENSE explosive showers of atomic fragments, splattering 200,000,000 particles over hundreds of acres, have been discovered in the earth's atmosphere. Each shower is caused by a single atomic bullet from outer space.

Announced to the University of Denver International Cosmic Ray Symposium in Idaho Springs, Colo., by Dr. Kenneth Greisen of Cornell University, these showers were detected by coincidental effects upon 200 Geiger counters in experiments at the Inter-University High Altitude Laboratory at Echo Lake, Colo., two miles above sea level.

Only about once a week do such gigantic showers, approximately a mile across, get detected in one place, but smaller bursts occur about every second, probably causing the streaks of particles that are the cosmic rays detected.

"We are dealing with the highest energy ever discovered in individual atomic particles, a billion times greater than the energy that is let loose by the fission of a single uranium atom," Dr. Greisen explained.

The actual amount of the energy in the particle that enters the earth's at-



COSMIC RAYS ARE INTERNATIONAL—At the symposium in Colorado (left to right) Dr. Manuel Sandoval Vallarta of Mexico, Dr. Hugh Carmichael of the Canadian National Research Council, Dr. H. Yukawa of Japan, Dr. Oreste Piccioni of Brookhaven National Laboratory, Dr. Byron E. Cohn of University of Denver, host institution.

mosphere and sets off a big shower is actually small and could hardly be felt if it were concentrated on one's head (a hundreth of a foot-pound). It is not useful, like the energy in the explosion of the atomic bomb, because there is no known way to concentrate and control the cosmic ray energies. But Dr. Greisen explains that discovery of the fission of this single uranium atom had to precede that great chain reaction that makes possible the atomic bomb.

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Another husband-wife pair of experimenters upon cosmic ray showers who reported their findings was Dr. and Mrs. C. G. Montgomery of Yale University. Other cosmic ray experts reporting on showers were Dr. Lloyd G. Lewis of Princeton and Drs. W. W. Brown and A. S. McKay of Cornell.

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New Rat-Killing Chemical

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The new compound, at present known simply as Compound 42, is a chemical relative of dicoumarol, the substance found in spoiled sweet clover that prevents the clotting of blood. It has a similar physiological effect, and thus starts and maintains fatal bleeding in the rats' abdominal areas.

Compound 42 does not kill at a single dose, as most other rodenticides do; four or five successive feedings are required. However, the effect is cumulative, and once a rat has eaten enough of it he is a "goner." Rats do not learn to avoid it, nor do they develop any tolerance.

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These are top names in science as well. Dr. Frank Oppenheimer, who has resigned his professorship at the University of Minnesota, received one of the few spontaneous bursts of applause at the very technical sessions devoted to unravelling the mysteries of the penetrating radiation from outer space that bombard the heights of Colorado's mountains most conveniently for scientific study. He had just reported the discovery of a strange burst of radiation, a cluster of photographic tracks made by particles of electricity, electrons, that seemed to have no assignable origin such as ordinary cosmic ray explosions usually have.

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There was no feeling of nationalism there. The cosmic rays rain upon the Urals and the Rockies. The cosmic ray experts are of many nationalities: Japanese, Canadian, Mexican, Chinese, Italian, Hungarian and many Americans, who have come to this country in almost every wave of immigration from the Puritans to the refugees from Hitler.

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WIND TUNNEL FROM GERMANY—This is one of the captured tunnels shipped to this country which is now helping American guided missile development. Here a model is being mounted in the Naval Ordnance Laboratory rotary wind tunnel preparatory to a "blow." (See SNL, July 2, p. 6.)

ENGINEERING

Superior Weapons

➤ TRUE security consists in being as far ahead as possible of any unfriendly nation, Dr. Karl T. Compton, chairman of the government Research and Development Board and formerly president of the Massachusetts Institute of Technology, declared before an audience of scientists and government officials at the dedication of wind tunnels and ballistics ranges at the Naval Ordnance Laboratory in White Oak, Md.

He was reviewing lessons learned from the recent war and his statement referred to improved weapons. "It was the overwhelming production of airplanes, of cargo vessels, of bulldozers, of landing craft and radar, all handled by brave and skillful men, that enabled our forces to stop, then to drive back, and finally to overwhelm our enemies," he said.

"The importance of beating the enemy in the race for new technical developments had many illustrations," he continued. "We beat him with microwave radar and with strategic bombers. He beat us to the snorkel submarine and V-1 and V-2 types of bombs; if he had got these things going several years earlier, the war might have had a different ending."

"To a rather astonishing degree, in the public and even in the military mind, security has come to mean secrecy. Secrecy is one aspect of security, for it is evident that, if we should freely broadcast all information about our new developments, we would permit our competitor to keep pace with us at relatively little expense to himself.

"Thus secrecy is the negative, or defensive, aspect of security. But if we sit tight and lock up our secrets, it will not be long before our active competitor forges ahead of us. So we must press forward the positive, or offensive, aspect of security by making rapid advances in our own science and its practical applications.

"Unfortunately secrecy and progress are mutually incompatible This is always true of science, whether for military purposes or otherwise. Science flourishes and scientists make progress in an atmosphere of free interchange of ideas, with the continual mutual stimulation of active minds working in the same or related fields. Any imposition of secrecy in science is like application of a brake to progress."

Another lesson of World War II is the power of teamwork, Dr. Compton stated. The outstanding characteristic of the attitude of our people during the war was the determination to go all-out for victory. It was "total war" from top to bottom. It was national teamwork in an unprecedented sense. It brought national success, and it brought personal satisfaction. And, he added, there was far better teamwork in our democratic country than in the totalitarian countries of our enemies.

The wind tunnels that were dedicated are of German origin (*See SNL*, July 2, p. 6). They were captured in Bavaria late in the war, dismantled and shipped to White Oak for the use of the American armed services in studying aerodynamics, and particularly in applications to guided missiles. They are the same tunnels in which the famous German V-2 rocket was developed.

Science News Letter, July 9, 1949

GENERAL SCIENCE

Economy Drive May Block Science Foundation

➤ THE Congressional economy drive, timed to the end of the government's money-year, may be the newest hurdle blocking a National Science Foundation.

A bill to establish the foundation has thus far failed to get approval of the House Rules Committee. Economy-minded members of the committee are understood to be balking at approval of the bill which would set up a new government agency for supporting scientific research and science training.

The House bill, introduced by Rep. J. Percy Priest, D., Tenn., and a similar one which passed the Senate in March do not appropriate any money, but they call for a foundation which would spend money. In his budget for the new fiscal year President Truman listed a total expenditure of $15,000,000 for the proposed science agency, $2,500,000 of appropriations and the remainder in contract authority.

Budget for the last fiscal year also included this estimate for the foundation, but the bill died in the House in the second session of the Eightieth Congress, after an earlier measure was vetoed by the President in 1947.

Science News Letter, July 9, 1949

ENGINEERING

Giant Magnet Assembled For New Atom Smasher

➤ WHAT is believed to be the largest magnet of its kind ever made has been assembled in Urbana-Champaign, Ill., for the University of Illinois' giant, new 300,000,000-volt betatron.

The laminated electrical transformer magnet for the new atom smasher is 23 feet long, six and a quarter feet thick and 13 feet high. It weighs 275 tons and was assembled by Allis-Chalmers from 70,000 sheets of magnet iron, each sheet being only 0.014 inch thick.

Dr. Donald W. Kerst, who developed this type of atom smasher and is directing the construction, estimates that the new scientific instrument is now half completed.

Science News Letter, July 9, 1949

MEDICINE

Chinese Anti-Germ Drugs

Tests of 45 Chinese drugs revealed that eight had antibiotic activity. However, although they check further growth of germs they do not kill them.

➤ EIGHT drugs commonly used in the Chinese practice of medicine have anti-germ activity of the kind that might class them with penicillin, streptomycin and other antibiotic drugs now commonly used in Western practice of medicine.

The antibiotic or anti-germ activity of the eight was found through tests of 45 Chinese drugs. The tests were made by Drs. H. Zanyin Gaw and H. P. Wang at the National Wuhan University, Wuchang, Hupeh, China. Dr. Wang is now teaching at Mount Holyoke College, South Hadley, Mass. Their studies are reported in the journal, SCIENCE (July 1).

Chinese drugs, they point out, are actually roots, stems, seeds, leaves or flowers of various higher plants which have been made very dry by a special process. When prepared for use, the dried material is cut in small pieces and boiled very slowly for two or three hours or longer. Drs. Gaw and Wang followed this method in preparing extracts of the drugs for their tests.

While penicillin comes from a mold, some newer antibiotic drugs have been obtained from higher plants, for example, tomatin from the tomato plant. This is what prompted the study of the Chinese drugs from plants.

The eight found to have anti-germ activity check the multiplication of the germs but do not kill them. Tests of the drugs on living human white blood cells show that they are not poisonous, which was to be expected, because prepared medicine is always given by mouth in Chinese practice.

Six of the Chinese drugs showed various degrees of anti-germ activity against Staphylococcus aureus, common germ of the family that may cause anything from boils to blood poisoning. The six are: Ta Huang from a leafy plant of the rhubarb family, Huang Lien from an herb, Coptis, sometimes used in garden borders, Hai Tung Pi from a crimson flowering coral tree, Shan Shu Yu from a variety of dogwood, Tsien Tsao from the same family as the dye-plant called madder, and Chi Hsueh Teng from a decorative shrub of eastern Asia.

Two other Chinese drugs showed anti-germ activity of relatively low potency against Escherichia coli, a germ normally found in the intestinal tract and often used in tests of the purity of drinking water. These two drugs are: Mao Ken from a buttercup, and Peh Pu from plants allied to the lily family.

Science News Letter, July 9, 1949

METEOROLOGY - ENGINEERING

New Machine Makes Fog

➤ SCIENTISTS have developed a fog machine, with which any kind of fog can be made.

And now that they can make fog, they hope to be able to learn enough about it to disperse it efficiently, to design fog lights and beacons of better visibility, and possibly even to develop fog screens for military purposes.

The machine was developed in the University of California Institute of Transportation and Traffic Engineering, which is primarily interested in reducing accidents on land, sea and air. In some sections of California, fog is a major hazard of private, commercial and military transport.

The scientists, headed by Prof. Dan M. Finch, an electrical engineer, first tried to use natural fog in their experiments. When the real thing proved to be too elusive, they set about constructing a machine which would produce the air pressure and temperature changes which give rise to fog in nature.

The machine is a double-walled tank, with windows for observation and photography. Warm or cold air is circulated through the jacket of the tank, depending on the kind of fog needed. Fog is made from cold or warm moist air poured into the inner tank from a connecting vapor tank.

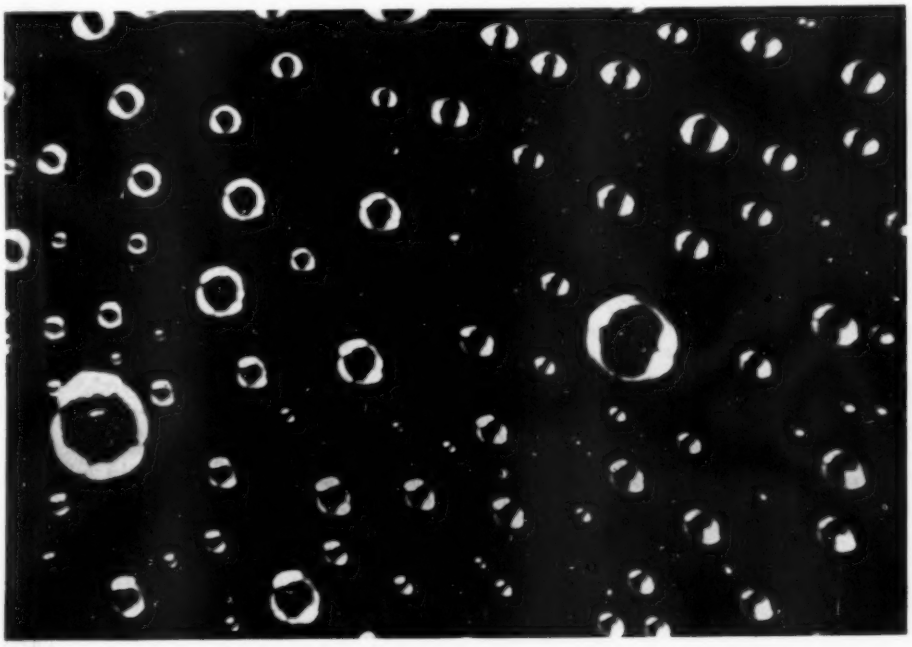
There are three principal types of fog: radiation fog, which occurs in valleys when the loss of heat to the ground through radiation produces vapor condensation; advection fog, which occurs along coastal areas when warm air from the water drifts in and mixes with air over a cold area; and pressure fogs, forming on hill summits when a saturated air mass moves up a hill and the resulting pressure changes cause the air temperature to drop below the dew point.

In the fog machine, for example, advection fog is made by a sudden mixing of warm saturated air from the vapor tank with a cool air mass in the fog tank. Pressure is changed by closing or opening an outlet valve.

Very little is known about the physical characteristics of fog, according to Prof. Finch. By using photomicrographic techniques with man-made fog, data on particle size, water content, temperature, density, dust content and composition of fog can be determined.

Better auto headlights, aircraft and other beacons, rail and highway signals, are the immediate objective.

Science News Letter, July 9, 1949



FOG DROPLETS—Magnified about 220 times, this photomicrograph of artificial fog droplets showed how they formed on a glass slide in the University of California fog machine.

MEDICINE

Synthetic Female Hormone Helps Men with Mumps

➤ A SYNTHETIC chemical with an effect like that of a female sex hormone is good medicine for men who get mumps, three Chicago physicians find.

The inflammation of the male sex glands which affects about one out of every five men who get mumps can be both prevented and relieved if it develops by this drug.

The drug is diethylstilbestrol. Its use at the Cook County Contagious Disease Hospital is reported by Drs. Archibald L. Hoyne, Jerome H. Diamond and Joseph R. Christian in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 25).

The fact that the sex gland inflammation, which is the severest complication of mumps, is almost never seen in children suggested that temporarily suppressing normal sex gland functioning in men might be helpful in mumps. The female hormone-like action of the synthetic drug, the doctors reasoned, might therefore be useful.

They gave the drug as a preventive to 20 men who had had mumps for from one to four days without symptoms of sex gland inflammation, called orchitis. Among the first 13 given this treatment, mild orchitis developed in two and moderately severe orchitis in one. The next seven patients were then given twice as much of the drug each day. None of them developed orchitis.

Larger doses were given to 19 men who had already developed orchitis. The results were in some cases "dramatic" with decided decrease in pain and tenderness within 24 hours. Every patient made "an uneventful recovery." The average patient was treated for about four days and was able to leave the hospital in about five days.

The drug is given by mouth in a capsule which, the doctors point out, makes it easy to take and it has no toxic effects. Preventive treatment is continued until the jaw-swelling of mumps has subsided.

Similar good results with this treatment, the Chicago doctors found, had been reported earlier by another physician.

Science News Letter, July 9, 1949

AERONAUTICS

Thrust Power in Jet Engine Double That of Weight

➤ TWO and a half pounds of thrust for every pound of engine weight is the rated power for a new Westinghouse jet engine released from former Navy secrecy. It is already in use in the Navy's McDonnell Banshee, a fast-climbing shipboard fighter for fleet operational units.

The Banshee is equipped with two of these engines. A pair of them also provide jet power for the Air Force's newest plane, the Lockheed F-90 penetration fighter, designed to operate deep in enemy territory against enemy aircraft and ground targets. The F-90 is a speedy plane, with 35 degrees of wing sweep-back.

This so-called J-34 is 10 feet in length and weighs about 1,200 pounds. Airplanes equipped with two of these jet engines will have more than 10,000 horsepower at command, because at modern flight speeds the engine's thrust is equivalent to better than 5,000 horsepower.

At a standstill, the slim engine sucks in air in the front end at 250 miles an hour, and spits it out the jet nozzle at the rate of 1,200 miles an hour. The compressor and the turbine of the engine whirl 12,500 times a minute to pack the 100 tons of air the engine "breathes" every hour.

Science News Letter, July 9, 1949

MEDICINE

Gamma Globulin Checks Animal Virus Disease

➤ THE blood's germ-fighting gamma globulin saved a woman who was dangerously sick with a brain disease when other treatments, including penicillin, had failed.

The patient had Western equine encephalomyelitis, popularly known as horse sleeping-sickness. This virus disease affects the brain and central nervous system of horses, and is transmitted to humans by mosquitoes and other insects. Besides horses, chickens and birds are believed to harbor the virus.

The patient was extremely ill with headaches, chills and fever, Drs. William Saphir and Albert Milzer of Chicago report in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 2).

Trial treatment with quinine was unsuccessful. Penicillin also had no effect, and the patient became worse.

Research by other scientists showed hyperimmune rabbit serum to be good in this disease. Since this serum was not available, the physicians hopefully administered gamma globulin from human blood. It was injected into the muscles daily for seven days in large dosages. The doctors noted that gradual and distinct improvement followed with eventual recovery.

They tested the gamma globulin administered to this patient and discovered that it contained neutralizing antibodies against the disease. However, since different batches of gamma globulin will have varying virus-killing properties, depending on the source of the blood, they feel that a special preparation of gamma globulin fraction of hyperimmune rabbit serum would be more suitable for use in human patients.

It was impossible to discover how the patient had contracted the disease since she lived in Chicago and had not left the city for several years. As far as was known, she had not come in contact with any sick animals.

Science News Letter, July 9, 1949

IN SCIEN

BIOCHEMISTRY

Radioactive Silk Spun From "Tagged" Compounds

➤ RADIOACTIVE silk has been spun by two moth larvae, in experiments reported to the journal, *Science* (June 24), by a four-person research team.

Interest centered not in silk as a fiber or fabric but in silk as a chemical compound, it is explained. Silk consists largely of a protein called fibroin, which can be used in research as typical of all protein, which may be considered the chemical basis of life itself. Hence the interest in getting a radioactive "tag" attached to it, for purposes of identification in various stages of its chemical life-history.

The silk was spun by the caterpillars of the big Cecropia moth, one of the first natural-history objects collected by most children. Small amounts of two amino acids, glycine and alaninine, "tagged" with radioactive carbon 14, were injected into the two fat larvae. About 24 hours later they started to spin their cocoons.

Radioactivity of the silk in these cocoons was proved in three ways: by the ticking of a Geiger-Muller counter, by photographic "autographs" left by fibers and clipped bits of silk placed in contact with camera film, and by elaborate chemical analysis.

The silk-spinning glands were dissected out of two other caterpillars and kept for several hours in a solution containing the radioactive carbon. Subsequent analysis of their proteins also showed the presence of radioactive silk substance.

These experiments were performed by Drs. Paul C. Zamecnik, Robert B. Loftfield, Mary L. Stephenson and Carroll M. Williams, of the Collis P. Huntington Memorial Hospital and Harvard University.

Science News Letter, July 9, 1949

GEOLOGY

Radioactive Carbon May Help Set Ice Age Dates

➤ RADIOACTIVE carbon in bones, shells and wood left behind by animals and plants that died during the latter part of the Pleistocene ice age may help materially in dating geologic events of 35,000 years ago. In the journal, SCIENCE (June 24) Prof. Richard Foster Flint, Yale University geologist, invites colleagues who have materials of this kind to send him exact descriptions, with a view to later analysis to determine their age.

Science News Letter, July 9, 1949

ENCE FIELDS

MEDICINE

Strange Blood Cells Found In Atom-Smasher Workers

➤ TWO unusual kinds of white blood cells have been found in the blood of persons working with the 130-inch cyclotron in Rochester, N. Y.

Whether they are the result of exposure to atomic rays from the atom-smasher has not yet been determined. If so, they might serve as indicators of radiation damage. Further studies of the cells are being pushed by Drs. M. Ingram and S. W. Barnes, working at the University of Rochester under a joint program of the Atomic Energy Commission and the Office of Naval Research.

One of the unusual white blood cells is a very early, or young, cell of the kind called mononuclear, meaning it has only one nucleus. The other is a white blood cell which seems to have a bi-lobed or double nucleus.

Both kinds of cells, the scientists report to the scientific journal, PHYSICAL REVIEW (June 1), have been found in persons not associated with cyclotrons but who were suffering from sore throats or other infections. The cyclotron workers, however, had no infections. And the bi-lobed or double nucleus cells have not, so far as the Rochester scientists could find, been previously seen in normal blood.

Science News Letter, July 9, 1949

NUCLEAR PHYSICS

Navy Ship Is Balloon Base For Cosmic Ray Studies

➤ GEIGER counter "telescopes" and other scientific equipment, held aloft by balloons and controlled from aboard a Navy ship, will be used in a new series of cosmic ray experiments during July and part of August.

Two groups of Princeton University scientists will conduct the experiments aboard the U. S. S. *Norton Sound*, which sailed from the West Coast around July 1.

The cosmic ray "telescopes" are Geiger counters which detect cosmic rays as they strike them from narrow angles in the direction which the counters are pointed. Sent high overhead by balloons, the counting "telescopes" will be pointed by remote control from the ship and data received by radio.

Scientists conducting the experiments are Dr. John R. Winckler, George Neilson Whyte, Thomas Howard Stix, Kirby Dwight, Jr., Robert Price and W. E. Rapp, all of Princeton, and Robert J. Sabin, on leave from the University of New Mexico, and Dr. Ira Meyers of the Department of the Army Signal Corps.

Dr. Winckler will direct a study with the "telescopes" of energy distribution of the primary cosmic rays and relative numbers of rays having positive and negative electrical charges. Another group, headed by Mr. Whyte, will investigate the number and size of nuclear explosions due to cosmic rays at different altitudes and the number of slow neutrons in the atmosphere at different altitudes. Ion chambers and special neutron counters will be sent up by the balloons for these experiments.

Science News Letter, July 9, 1949

ASTRONOMY

Pale Green Sun (Not Moon) Is Observed by Scientist

➤ THE SUN (not the moon) was seen as pale green just before its rim slipped below the horizon on an evening in February. The observer was Dr. E. O. Hulbert, physicist of the Naval Research Laboratory, who specializes in the optics of the atmosphere.

Dr. Hulburt reports the occurrence and also gives his explanation for it in a brief report to the JOURNAL OF THE OPTICAL SOCIETY OF AMERICA (May).

He saw the green sun while flying in an airplane at an altitude of about 8,000 feet above a complete cloud cover about 2,000 feet below. The air was very clear, Dr. Hulburt reports, right down to the blanket of clouds. This is important for observing a green sun. If the sun appears red as it begins to sink below the horizon, you can be sure you will not see the disappearing rim as green, because when it looks red it is because the blue and green portions of the spectrum are filtered out by the atmosphere.

On this particular evening, the sun was a pure yellow as it began to dip below the cloud-sky horizon. Just before the last segment slipped from view it turned from yellow to white and finally to a distinct green.

The color lasted very briefly and might easily escape casual observation. It lasted, Dr. Hulburt estimates, not more than three seconds or less than two.

The prismatic dispersion of the normal atmosphere for a ray tangent to the surface of the earth is 22 seconds of arc, and at 6,000 feet altitude where the pressure is about 0.8 atmosphere, it amounts to about 18 seconds of arc. The observed time of about two seconds which elapsed from the appearance of the green segment to its disappearance below the horizon corresponded to an angular motion of the sun of about 23 seconds of arc. This was near enough to the calculated value of 18 seconds of arc, Dr. Hulburt concludes, to indicate that the dispersion of the normal atmosphere was adequate to account for the sun's looking green.

Science News Letter, July 9, 1949

NUCLEAR PHYSICS

New Kind of Trap Built For Cosmic Ray Studies

➤ A NEW kind of trap for cosmic rays that bombard the earth from outer space was announced to the University of Denver International Cosmic Ray Symposium in Idaho Springs, Colo., by Dr. J. Warren Keuffel of Princeton University. It permits scientists to look inside a large mass of matter and see, by means of spark signals, just when and where the inrushing particles explode the hearts of atoms they smack into here on earth.

It gives one more tool for use in puzzling out one of the universe's major mysteries: the structure of atomic particles and the composition of the far-distant parts of the universe that give birth to the most powerful radiation that man has ever detected.

The new parallel plate counter stack is a pile of ten steel plates, each a half-inch thick. Each plate fires a counting device within five-billionths of a second of the impact of the cosmic ray. In addition to electronic counting devices, cameras focused on the spaces between plates can photograph the sparks that mark the passage of the particle. The heavy iron stops and decays many more particles, because it is heavier than air used in conventional cosmic ray counters.

Science News Letter, July 9, 1949

GENERAL SCIENCE

Awards Go to Scientists For Work with Hormones

➤ THE discoverer of the growth hormone and the scientist whose studies have revealed the effect of a hormone now believed effective against arthritis, were singled out for honors by the Association for the Study of Internal Secretions in New York.

Dr. Herbert M. Evans, director of the Institute of Experimental Biology, University of California, was given the E. R. Squibb and Sons Award for his contributions to knowledge of the trophic hormones of the pituitary gland and his discovery and purification of the growth hormone.

Dr. George Sayers of the University of Utah Medical School received the Ciba Award for studies showing the effect of the adrenocorticotrophic hormone of the pituitary gland on the adrenal glands which are situated above the kidneys.

Selection of Dr. George M. Brown, Jr., as the Ayerst, McKenna and Harrison Fellow, and of Dr. D. Lawrence Wilson, as the first recipient of the newly established Schering Fund Fellowship, was also announced by the association. Dr. Brown will work at the University of Pennsylvania and Dr. Wilson at the Harvard University Medical School.

Science News Letter, July 9, 1949

BOTANY-CHEMISTRY

Poison Ivy Is Perennial Pest

A new chemical, 2,4,5-T, is the latest weed-killer found effective against poison ivy. It is related to 2,4-D but is considered an improvement over it.

By DR. FRANK THONE

➤ POISON IVY is a perennial pest, in a dual sense. In the literal, botanical meaning of the word, poison ivy is a perennial plant: its glossy-green but evil-laden leaves come forth thickly year after year on woody branches of a myriad-rooted vine that climbs up tree-trunks and over rocks or trails along just under the ground surface as a long, snaky rootstock. It overruns and smothers out wildflowers and shrubs, finally monopolizing the ground in woodlands where the overhead canopy is not fully closed.

Perennial, too, are its painful effects on its victims, for no one who is sensitive to poison ivy ever acquires a natural immunity. Moreover, susceptibility to ivy poisoning appears to be a definite hereditary trait, passed on from parent to offspring through generation after generation. It might be likened to the doctrine of Original Sin in reverse—a kind of undying Original Innocence, exposing its unfortunate possessors to itching, blisters and general misery every summer of their lives.

Some Are Immune

There are some lucky individuals on whose resistant hides poison ivy has little or no effect. However, they are outnumbered more than two to one by those who suffer after every contact. Such resistance or immunity cannot be guaranteed permanent, either; a heavy exposure to the weed may break it down, and once lost it is never regained.

Small wonder, then, that poison ivy is dreaded and hated everywhere, and that some people hesitate to enjoy outdoor fun for fear of having literally to pay for it through their skins. For such supersensitives, however, the past few years have brought good news.

Poison ivy used to be considered just about impossible to kill. Older chemicals, that would make a quick end of most weeds, would merely wither the leaves on poison ivy, and the dead foliage would soon be replaced with more, just as bad as the first. During the war years, however, two weed-killers were developed that proved quite effective against the three-leaved pest. Ammate and 2,4-D were the convenience-names under which these were finally offered to the public.

This year a new compound is being marketed which is claimed to be a definite improvement over 2,4-D as a killer of woody growths. It is chemically related to 2,4-D, and is tagged 2,4,5-T for short. Spelled out in full, it is 2,4,5-trichlorophenoxyacetic acid. But even chemists and weed eradicators don't stop to recite all that: 2,4,5-T is enough. It is commonly sold in ready-mixed preparations, with directions for dilution and use printed on the label. Each manufacturer of course uses his own trade-name, but the actual formula will also be given.

Ammate, incidentally, is by no means out of the running. Some long-experienced veterans of the weed war still declare it's the best poison-ivy poison there is. It costs more than either 2,4-D or 2,4,5-T, but they say it's worth the difference, especially where quick results are wanted, as around yards where children play, or in the immediate vicinity of summer camps and cottages.

There is, of course, no way of getting rid of all poison ivy. It is just too abundant and widely distributed. All you can do is spray it to death where exposure of human skin to its venomous leaves is most frequent.

Best treatment for poison ivy is the absent treatment. Learn to recognize it—and shun it. You don't have to be a botanist to know poison ivy when you see it; that compound leaf with the three leaflets is its trademark. If you see such leaves on twiggy, many-rooted vines that climb up things, or on shrubby growths from knee- to shoulder-high rising out of the ground, stay away from them. "Leaflets three, let it be!" is an old but good rhymed rule to remember.

Poison ivy is one of the most widely distributed plants in North America. It ranges from Canada south to Florida, westward until it meets the deserts of the Southwest, northwestward to Puget Sound. There its range overlaps that of the Pacific Coast species, commonly known as poison oak. Actually, the two look so much alike that it takes a Ph. D. in botany to tell them apart—and some trained botanists aren't too sure that there is any real distinction.

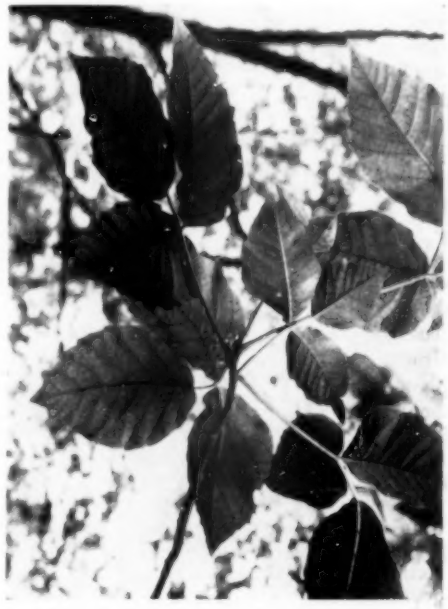
There is a third member of this Borgian cousinship, poison sumac. This looks very much like the beautiful tall sumac that touches brushy hillsides with flame in autumn. However, it grows only on the wet borders of acid-water bogs, where most people would not think of going picnicking, so there is less need to worry about running into it.

Botanically, this triad of pests is a closely related clan. Poison ivy is not a real ivy, and poison oak emphatically not an oak, but poison sumac is a true sumac—and so are the other two. Like every large family group, the sumacs have some disreputable members, and these three are the black sheep of the sumac tribe. Although poison ivy, poison oak and poison sumac are all strictly American in their range, there are other poisonous sumacs in foreign lands, especially in the tropics. Most notorious of these overseas "baddies," however, is another temperate-zone species, a tall shrub or small tree that grows in Japan and China, and is the source of the beautiful lacquer much admired on Oriental furniture and art objects.

Toxic Principle

The toxic principle in all these poisonous members of the sumac tribe is an oily, non-volatile substance first identified by a Japanese scientist near the beginning of the present century. He gave it the name "urushiol," from the Japanese word for the lacquer-producing tree, which is "urushi no ki."

The fact that this poisonous substance is non-volatile, that is, not readily turned to a vapor, surprises some persons who have the idea that poison ivy or poison oak can harm their sensitive skins even if they don't actually touch the plant. This seeming action-at-a-distance is easily explain-



POISON IVY—This is a close-up shot of the leaves from the under side. Note the cluster of tiny, inconspicuous flowers near top of stem. Some botanists state that the poison is most virulent when the plant is in bloom.

POISONING THE POISONER—Here one of the new chemical killers of poison ivy is being applied with a pressure-spray outfit.

able, when it is understood that touching objects that have in turn touched poison ivy can transfer the poison in sufficient quantity to start the mischief on more-than-ordinarily sensitive skins.

If you pet a dog or cat that has been running through poison ivy, or work with garden tools that have brushed against it, even toss up a tennis ball that some hardy immune person has retrieved out of a patch of the weed, you may start a case of ivy poisoning. Although the smoke from burning poison ivy or poison oak that has been grubbed up and dried cannot cause poisoning, it is apt to contain small bits of unburned leaf or bark material capable of causing blisters.

Proposed remedies for ivy poisoning have been listed literally by the hundreds. They range all the way from juices from various crushed herbs, supposed to be "old Indian remedies," to concentrated solutions of photographer's hypo. No one single treatment appears to be good for everybody, but there is one that has been used for more than a generation with good success by large numbers of persons known to be sensitive. This is the so-called "iron treatment."

It consists of a five percent solution of ferrous sulfate, or copperas, in a half-and-half mixture of water and alcohol, plus a little glycerin, if desired. In contact with the poison, the iron combines with it to form an insoluble, non-irritating compound.

While this can be sponged onto ivy-poisoned skin after the damage has started, it is still better to use it as a preventive. You just wash it freely over all exposed skin surfaces and let it dry "as is," before you go into places where poison ivy or poison oak is likely to be encountered. Then the poison is immediately contacted by the iron salt when you brush against the plant, and it never gets started. There are a few hyper-sensitive skins that cannot be thus protected, but for a majority of ivy-susceptible persons this solution is a suit of invisible iron armor.

Science News Letter, July 9, 1949

MEDICINE

May Check Pregnancy Ill

➤ EXPECTANT mothers of the future may be saved from a dangerous, often fatal disease, thanks to a "happy accident" discovery by Dr. Alexander Symeonidis, special research fellow of the National Cancer Institute.

The disease is eclampsia. It accounts for between one-sixth and one-fifth of all maternal deaths in the United States. High blood pressure, impaired kidney function, abnormal accumulation of fluids in body cavities and convulsions are symptoms of this disease which attacks late in pregnancy and often causes death of the unborn baby as well as the mother.

Injections of a female hormone, progesterone, which is essential to pregnancy, caused symptoms and tissue changes in rats late in pregnancy that are strikingly similar to those found in human eclampsia, Dr. Symeonidis discovered.

At the time he made this discovery he was investigating the role of the hormone in breast cancer. Whether tumors will also develop in the rats, as expected, is still being investigated.

The accidental discovery of the relation between the hormone and eclampsia, however, is considered a step toward discovery of the cause of this disease which has defied doctors and killed mothers for thousands of years. Once the cause is definitely established, there is hope for more reliable means than now available for curing or preventing the condition.

Dr. Symeonidis believes that the eclampsia in the rats was the result of an unbalanced condition between the ovaries, pituitary gland and placenta induced by high doses of progesterone at a critical stage of late pregnancy. As an alternative, he points out that poisonous substances produced in the damaged placenta might be responsible. Evidence for this theory is the fact that some of the rats recovered after discharging dead embryos and damaged placentas.

The accidental nature of Dr. Symeonidis' discovery, made in the course of cancer research, is somewhat ironic. In a series of experiments in 1936 in Germany he tried unsuccessfully to produce eclampsia in animals.

Science News Letter, July 9, 1949

MEDICINE

Super-Intensive Treatment Effective for Epileptics

➤ GOOD results with a super-intensive treatment of epilepsy were reported by Dr. Tracy Putnam of Los Angeles at the meeting of the American Neurological Association in Atlantic City.

The super-intensive treatment was designed for patients not helped by the usual and less rigorous methods of treatment. Modern drugs, special diets, exercise and other measures fail to control the seizures, commonly called fits, in from 10 to 30 out of every 100 epileptics, Dr. Putnam stated.

In the new treatment, patients were put to sleep with one of the modern sleeping medicines and kept asleep for three to six days. This was supplemented by daily doses of phenytoin or other of the modern anti-epileptic drugs. Glutamic acid, a chemical once reported effective in stimulating intelligence, a special diet and inhalations of carbon dioxide were also given in what Dr. Putnam termed "hyperintensive treatment."

All five patients treated showed some improvement. Two continued to have attacks but had them less often. And they showed improvement in personality. The other three patients have remained free of attacks for periods up to a year.

Science News Letter, July 9, 1949

MEDICINE

Relieve Stings and Bites

➤ BEE STINGS and insect bites can be successfully treated with an ointment containing one of the anti-allergy drugs, Dr. William Theodore Strauss of Upper Montclair, N. J., reported in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 18).

The anti-allergy drug in the ointment he used is called thephorin. Technically, it is an anti-histamine drug. Most modern anti-allergy drugs are anti-histamines, because the symptoms of hayfever and other allergies are believed due to overproduction of histamine in the body.

Dr. Strauss believes that too much histamine is the cause of the pain, swelling and other symptoms following bee stings and some insect bites.

"One particularly interesting case" Dr. Strauss reports is that of T. S., a five-year-old boy who accidentally walked into a swarm of bees.

He got seven bee stings, four on the right leg just above the ankle and three around the left ankle. Within a few minutes the doctor had put thephorin ointment on the stings and surrounding skin. The little boy stopped crying within a minute and said all the pain had disappeared. A little later, playing in the same area, he got another sting on his right thigh. This also was quickly relieved by the ointment. There was no swelling and the only signs of the stings were pinpoint spots where a drop of blood had been drawn at the actual site of the sting.

In each of seven other cases, including several of ant bites, the intense pain and stinging sensation was relieved within one or two minutes after the ointment was put on. One patient said the pain seemed to "melt away."

The intense pain from "bites" of hornets, wasps, mosquitoes and ants can also be relieved by thephorin ointment, other doctors have told Dr. Strauss.

An allergic reaction to the protein of the bee venom, rather than inflammation from the acid, is the cause of the pain, swelling and occasionally more severe symptoms from bee stings in Dr. Strauss' opinion. There is no longer any place, he says, for such old-fashioned treatment of bee stings and insect bites as ammonia, soda or mud packs.

Science News Letter, July 9, 1949

NUCLEAR PHYSICS

Cut Atomic Casualties

➤ A TEN-MINUTE warning that an atomic bomb will drop can reduce the casualties of a normal city ready for atomic attack from 100,000 to 10,000, Dr. R. E. Lapp, ONR physicist and author of MUST WE HIDE?, told the Western Safety Conference in Portland, Ore.

But no government agency is actively educating the public on atomic warfare, Dr. Lapp warned. Unless the public is convinced that we can deal with atomic attack, which he estimates may come within five years of 1960, we may have a disastrous, Orson Welles exodus from cities threatened with atomic destruction.

Underground shelters can protect against an atomic explosion, Dr. Lapp declared. He feels that the terrors of radiation have been vastly overemphasized. Radioactive remains of an atomic bomb detonated in the air, as at Hiroshima, are swept up into the stratosphere where they are dispersed harmlessly. The ground beneath is not made uninhabitable, and contrary to common fears, people can reoccupy the area. Dr. Lapp also discounted the dangers of underwater atomic explosions spraying lethal doses of irradiated water, because deep water in which to drop the bomb is lacking at most cities.

Cities should be planned so that they are not the ideal atomic bomb targets that they are today, he told the safety meeting. The cluster of tall buildings in the center of about 20 American cities, each of more than half a million population, is the vulnerable heart of such populations.

One bomb dropped on Manhattan and properly detonated over one of the two clusters of skyscrapers could kill 200,000 and injure a like number, he estimated.

Nevertheless, if we undertake to defend our cities, Dr. Lapp said, an enemy could not cause the capitulation of this country even though our principal cities were bombed with 200 bombs and 10,000,000 people killed if no precautions were taken.

To be successful, an enemy must destroy America's ability to fight back, Dr. Lapp declared. An aggressor nation with atomic bombs would not attack cities indiscriminately, in Dr. Lapp's opinion, but the bombs would be concentrated on American industries that would allow us to strike back immediately. Bombs would not be wasted upon the huge American steel industry, the critical Soo locks vital to transporting iron ore or even the atomic energy installations, such as Oak Ridge. Instead, Dr. Lapp believes that if the enemy knows its stuff it would be concerned about the atomic bombs we have stockpiled and not those which we could make in the next year. The enemy would attempt to destroy the factories making items essential to our striking back, or the depots and transportation bottlenecks that would be sorely needed in our own atomic counteroffensive.

No critical industry should be concentrated at any one location where it could be knocked out by one atomic bomb, Dr. Lapp warned.

"No magic defense against the atomic bomb will be invented," Dr. Lapp declared. "No reputable scientist believes that an instrument or machine will be invented which will explode atomic bombs prior to their intended time of detonation."

Science News Letter, July 9, 1949

"Program" Control Speeds Up This Research Program

Geologists at Rensselaer Polytechnic Institute are relieved of much routine data-taking and temperature-controlling work in research on thermal expansion of minerals, through the use of Micromax Program Control for laboratory furnace. Once test is set up, it can run virtually unattended. Write for information applicable to your problem.

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ZOOLOGY-ETHNOLOGY

NATURE RAMBLINGS

by Frank Thone

America's Cherubim

➤ FROM bison to bodiless child-angels may seem a very far cry, yet there does seem to be a fairly continuous chain of descent. The majestic winged human-faced bulls that guarded the gates of palaces and temples in ancient Mesopotamia were known by the Semitic name from which our word "cherubim" is derived. Because of their bellowing voices, thunderclouds were imagined by the ancients as flying bulls, the steeds of the highest of the gods.

Originally, these winged bulls were the old-world species of bison, or wisent, now all but extinct. Known in the earliest times in the Tigris-Euphrates valley, they had disappeared long before Babylon grew great. Hence the conventional representations had bodies more like those of domestic cattle. Yet their origin is traceable in their curved horns, symbols of power, and in their beards.

How these fabulous cloud-bulls were transformed into the second-highest order in the angelic hierarchy might be a long story. Sufficient to suggest here that the "cherubims" (a false plural, by the way) described with meticulous detail in the twenty-fifth chapter of Genesis are believed by some archaeologists to have been images much like those surviving in the Mesopotamian ruins—proper seat for the God who was above all gods. And since images must not be made of Him, soon images were no longer attempted of them.

The puckish mischance by which the cherubim, after they had become very great angels, were further transmogrified by modern fancy into the littlest of angels—often consisting of head and wings only—is still another story. But from the mighty cherubim of antiquity to the "sweet little cherubs" of modern picture-cards (and sometimes tombstones) is surely a strange evolution!

Yet you can catch a far glimpse of how it all started, the next time you visit the Zoo, or better yet, ride through Yellowstone National Park. Just wait until one of the majestic old bison lifts his head and looks at you. Isn't there something hauntingly near-human in the look of that horn-crowned, bearded face?

Science News Letter, July 9, 1949

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ENGINEERING

Magnetic Survey for Ores

➤ SURVEYING the crust of the earth for possible hidden metal ores and petroleum with magnetic instruments has proven its worth, the UNSCCUR will be told at its August meeting at Lake Success, N. Y., by J. R. Balsley, Jr., of the U. S. Geological Survey. He will base his statements on the experience of the Survey over years with the ground-based instrument and experience of the past five years with the airborne magnetometer.

The airborne magnetometer was used during the war floating through the air under and behind an airplane to detect submerged enemy U-boats in the Atlantic ocean. Its findings passed in electric signals to the plane by means of the trailer cable. During and since the war, this type of airborne instrument has been used to survey many thousands of square miles of territory in a search for hidden minerals, and particularly for geological formations in the crust of the earth favorable for petroleum.

UNSCCUR is an international organization promoting worldwide developments through the interchange of scientific knowledge. Its full name is the United Nations Scientific Conference on the Conservation and Utilization of Resources.

The airborne magnetometer is, according to Mr. Balsley, a high-speed, low-cost reconnaissance geophysical instrument which can be used to produce magnetic maps of the same order of accuracy as those produced by ground magnetic instruments.

It is not well suited for making small detailed surveys or for use in mountainous areas. It is particularly useful in areas which are difficult to traverse on foot, and in combination with radio and radar location systems can be used to conduct surveys over water or other unmapped areas.

The over-all accuracy of the results of the airborne magnetometer can be most easily discussed by comparison with that of the more familiar ground magnetometer of the Schmidt type, he will say. The results of the aeromagnetic survey are compiled into a magnetic contour map or a series of magnetic profiles of tthe same type as those obtained by ground methods.

Although geophysical ground magnetic surveys usually measure variations in either the vertical or horizontal components of the earth's magnetic field, aeromagnetic surveys measure variations of the total field. In practice the two methods do not compete but complement each other.

Science News Letter, July 9, 1949

Words in Science—
BENZINE-BENZENE

➤ BENZINE and benzene are not alternate spellings for the same word; they are completely different chemicals.

The fluid you sometimes use to clean spots from your vest is benzine. Like benzene, it is colorless and inflammable. It is derived from crude petroleum by fractional distillation, and is a mixture of various hydrocarbons.

Benzene, which is the starting point in the manufacture of compounds of the benzene series, is not a mixture but a single compound, obtained chiefly from coal tar. It is used in the manufacture of organic chemicals. Benzene is another word for benzol.

Science News Letter, July 9, 1949

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

AMERICAN WILD FLOWERS—Harold N. Moldenke—*Van Nostrand*, 453 p., illus., $6.95. Describes and illustrates America's favorite wild flowers from coast to coast and from Canada to Mexico. Written for everyone interested in natural history.

CLASS SIZE: The Larger High School—Ellsworth Tompkins—*Gov't. Printing Office*, 29 p., illus., paper, 20 cents. Furnishes information basic to the consideration of class size.

COCHISE AND MOGOLLON SITES: Pine Lawn Valley: Western New Mexico—Paul S. Martin, John B. Rinaldo and Ernst Antevs—*Chicago Natural History Museum*, 232 p., illus., paper, $3.50. A study of some of the problems of the origin and development of Mogollon culture.

DIRECTORY OF MEDICAL SPECIALISTS, Vol. 4—E. L. Jenkinson, Chairman, Directory Committee—*Marquis*, 1182 p., $12.25. Issued under the authority of the Advisory Board for Medical Specialties.

GENETICS PALEONTOLOGY AND EVOLUTION—Glenn L. Jepsen, George Gaylord Simpson and Ernst Mayr, Eds.—*Princeton University Press*, 474 p., illus., $6.00. A presentation of various aspects of organic evolution by the Committee on Common Problems of Genetics, Paleontology, and Systematics of the National Research Council.

THE GEORGE C. DAVIS SITE CHEROKEE COUNTY, TEXAS—H. Perry Newell and Alex D. Krieger—*Society for American Archaeology* jointly with *American Antiquity*, 225 p., illus., paper, $3.50. A description of the site, excavations and buildings with an analysis and interpretation included.

LABORATORY EXPLORATIONS IN GENERAL ZOOLOGY—Karl A. Stiles—*Macmillan*, rev. ed., 311 p., paper, $3.25. A complete revision of this manual. For the college freshman.

MAN ON THE LANDSCAPE: The Fundamentals of Plant Conservation—Vernon Gill Carter—*National Wildlife Federation*, 129 p., illus., $1.50. For teachers and students of plant science.

MATHEMATICAL TABLES—Harold D. Larsen—*Rinehart*, 160 p., illus., $1.00. Part one of the regular edition of *Rinehart Mathematical Tables*, containing the numerical tables most frequently needed in mathematics and engineering..

THE NATURE-NURTURE CONTROVERSY—Nicholas Pastore—*King's Crown Press*, 213 p., $3.25. An attempt to gain some insight into the interrelationships of heredity and environment by giving short biographies of America's contemporary scientists.

NEW KNOWLEDGE THROUGH SCIENTIFIC RESEARCH IN MELLON INSTITUTE—E. R. Weidlein—*Mellon Institute*, 39 p., illus., paper, free upon request to publisher, University of Pittsburgh, Pittsburgh 13, Pa. The 36th annual report describes the current activities.

A NEW SILURIAN TRILOBITE DALMANITES OKLAHOMAE—Eugene S. Richardson, Jr.—*Chicago Natural History Museum*, 3 p., illus., paper, 10 cents. Description and remarks.

NOTES ON GROWTH AND REPRODUCTION OF THE SLIMY SALAMANDER PLETHODON GLUTINOSUS—Clifford H. Pope and Sarah H. Pope—*Chicago Natural History Museum*, 11 p., illus., paper, 20 cents. A short study of a collection made in 1948 at Mountain Lake Biological Station, Giles County, Virginia.

106 SUCCESS OPPORTUNITIES: An Exploration in the World of Work—*Arco*, 394 p., illus., $2.50. Material for young people and veterans who need guidance in selecting their careers.

PERSONAL ADJUSTMENT IN OLD AGE—Ruth Shonle Caven, Ernest W. Burgess, Robert J. Havighurst, and Herbert Goldhamer—*Science Research Associates*, 204 p., illus., $2.95. The first report of a ten-year research project at the University of Chicago on the problems of aging.

SCHOOL LUNCH RECIPES USING CANNED FOODS: 25-50 Servings—*National Canners Association* (Home Economics Division), 24 p., illus., paper, free upon request to publisher, 1739 H Street, N. W., Washington 6, D. C. Fits into any type of school lunch service.

SCIENCE AND IMAGINATION IN SIR THOMAS BROWNE—Egon Stephen Merton—*King's Crown Press*, 156 p., illus., paper, $2.50. A study of Browne's scientific, philosophical, and artistic views.

THE SERIAL UNIVERSE—J. W. Dunne—*Faber* (Distributed in this country by *Macmillan*), 2nd ed. reprinted, 243 p., illus., $3.00. A mathematician's view of the physical world as a series of related events reaching to infinity.

TEACHING CONDITIONS AND THE WORK WEEK OF HIGH SCHOOL SCIENCE TEACHERS—*National Science Teachers Association*, 18 p., paper, 25 cents.

Science News Letter, July 9, 1949

GENERAL SCIENCE

UNESCO Seeks Freer Exchange of Publications

➤ FREER exchange of newspapers, books, magazines and most printed matter between nations is the aim of proposed agreement which will be discussed in September at the general conference of the United Nations Educational, Scientific and Cultural Organization in Paris.

A draft of the UNESCO agreement to facilitate international circulation of publications has been circulated to member states.

The draft calls for granting publications freedom from customs duties and import licensing systems and extension of foreign exchange facilities for purchase of publications. Safeguards for domestic publishing industries are provided.

A similar agreement for audio-visual materials will become effective when 10 member states ratify its provisions.

Science News Letter, July 9, 1949

On This Week's Cover

➤ THE first inkling that heavy nuclei exist in cosmic rays came from cloud chamber photographs taken from a balloon sent up 18 to 20 miles above the earth. The balloon apparatus which is pressurized and air-conditioned so that the cloud chamber will work at extreme altitudes was developed by Dr. Edward Ney and Mrs. Phyllis Freier of the University of Minnesota, who were in one of the groups reporting this discovery to the University of Denver International Cosmic Ray Symposium. Dr. Frank Oppenheimer headed the Minnesota group which in conjunction with scientists at the University of Rochester demonstrated the existence of the heavy particles. (*See SNL*, July 2, p. 3). On the cover a heavy nucleus (probably carbon) is shown as it enters the chamber from the upper right, penetrates one-fourth of an inch lead plate and breaks up in the next lead plate. In the interaction 12 particles arise.

Science News Letter, July 9, 1949

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WINDOW VENTILATOR, that fits snugly under the sash of a partly open window, contains within it an air filter of glass fiber or a processed fiber that will remove the entering air dust particles, pollen and dirt, it is claimed. It is available in natural aluminum or tan-baked enamel finishes.

Science News Letter, July 9, 1949

SCISSORS SHARPENER for the home or office is a small block to rest on the table which has a bevel cut in its upper face into which an abrasive surface is fitted. A handle makes it easy to hold the block in position while the scissors blade, guided by the bevel, is pushed over the abrasive.

Science News Letter, July 9, 1949

CARPET SWEEPER, operated on the ordinary house current, has a whiskbroom-like action, cleaning at the rate of 3,500 sweeps to the minute. It is light in weight and easily maneuvered on its gliding, wheel-less base, and is claimed to be able to pick up lint and small particles that defy the vacuum cleaner.

Science News Letter, July 9, 1949

BATHTUB SEAT for the baby, shown in the picture, makes the job of washing the wiggler easier. The device is made of a durable plastic, uninjured by soap and water, and has four rubber suction cups to secure it to the bottom of the tub, while two strips of webbing hold baby in place.

Science News Letter, July 9, 1949

RUBBER MATS, for the kitchen, bathroom or hallway, have brilliant, full-colored illustrations inlaid in the rubber itself as integral parts of the mat, where they remain permanently. Including the picture is due to a new development that makes it possible to inlay pure rubber with designs.

Science News Letter, July 9, 1949

PLASTIC CUP-SHAPED container for food in the home has an overlapping flexible plastic cover that is easily "peeled" off by hand but can be used over and over again. The cover continues to make a tight seal, which prevents the leakage of liquids, and cover and container are both transparent, permitting easy examination of contents.

Science News Letter, July 9, 1949

CARPET, in which weaving is eliminated by cementing the tufts to a heavy cloth backing, is ravel-proof and fray-proof, and can be cut in any direction for fitting or repairing. The adhesive, a development of a rubber company, is tough but flexible, holds the wool tufts, or pile, securely even under rough usage.

Science News Letter, July 9, 1949

HIGH-SPEED PAPER counter which can count as many as 1,000 sheets in a pile in a few seconds, is an electronic hand-tool whose stylus is slid quickly over the edges of the paper after the package has been stacked to provide a step-like end. As each sheet is touched separately by the stylus, an electric impulse makes a recording.

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Do You Know?

One of every 25 new permanent single-family dwellings started in America in 1948 in non-farm areas was a factory-built or *prefabricated house.*

The origin of the *speedometer* used on automobiles is attributed to Benjamin Franklin who, while Colonial Postmaster General, invented and used a device on his carriage to measure distances between post-offices.

Fuel that will burn in the airplane engine, but will not catch fire in combat or in a crash, is needed because fire is the greatest hazard of flying.

Germans developed a satisfactory *edible fat* from coal during the recent war.

Hay on many farms is now being cut in bad as well as good weather and dried in the haymow by means of a powered blower that forces air through tunnels under the crop and out through many openings into the hay itself.

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